

Insiders' Assessments of the Stock Market's Pricing of New England Bank Stocks, 1988 to 1991

The 1980s and early 1990s experienced a surge in bank failures not seen since the Great Depression. The financial crisis prompted many policy proposals in search of an improved regulatory and supervisory framework. One such reform would enhance the role of market forces in the disciplining of banking institutions. If external stakeholders can determine the risk exposure of individual banks, it is argued, differential prices can be set on the institutions' stock and debt instruments to reflect this exposure (Gilbert 1990). Differential pricing makes excessive risk-taking costly and thereby discourages such activities, improving the safety and soundness of the industry. For effective market discipline, however, outside monitors must determine an individual institution's risk exposures in a timely manner and price the firm's securities accordingly. This study assesses the effectiveness of one type of outside monitor, stock market participants, in identifying New England banks' exposure to the region's real estate market in the late 1980s and early 1990s.

An examination of this issue is important for evaluating the potential role private sector claim-holders can have in the monitoring and disciplining of banks. Some proposals advocating an increased role for market forces suggest dismantling much of the current regulatory framework, including deposit insurance, so that more claim-holders have incentives to monitor and discipline their banks. Unfortunately, the very nature of banking may make this monitoring and disciplining difficult to achieve. Assessing the quality of a bank's loan customers as well as uncovering a bank's hedging strategies from existing accounting data is a complex process.

The informational asymmetries between bank insiders and outsiders are an important motivation for bank regulation. In such an environment, solvent banks can be prone to depositor runs during periods of financial uncertainty (Bryant 1980; Gorton 1985; Chari and Jagannathan 1988). To the extent panic-driven runs would occur in the absence of regulation, the

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current framework may help stabilize our financial and monetary systems. However, this justification for regulation depends on an assumption that outsiders have difficulty assessing the financial soundness of a bank. This study looks at one episode of financial uncertainty, the collapse of the New England real estate market in the late 1980s and early 1990s, to examine the validity of this assumption. Specifically, the study considers whether bank shareholders assessed accurately a bank's exposure to New England's real estate market.

I. Previous Studies of Bank Share Pricing

Two types of studies have examined the pricing of bank stocks. The first, contagion studies, looks at the stock price movements of solvent banks in response to critical announcements made by a bank that eventually fails (Aharony and Swary 1983; Lamy and Thompson 1986; Peavy and Hempel 1988; Karafiath and Glascock 1989; Aharony and Swary 1996). In general, these studies find a negative impact on the equity value of solvent banks after new information is

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disclosed by the failing bank. This negative effect is more severe if the solvent bank has characteristics similar to those of the failing institution. Unfortunately, it is difficult to infer from these studies whether these contagion effects are justified. Does a failing bank's announcement reveal new information regarding the financial soundness of other banks, which market participants then correctly incorporate into share price of these banks? Or, conversely, are the price reactions unjustified? If the solvent banks, as viewed from accounting data, had portfolios similar

to that of the failing institution but were better protected, taking into account loan quality and hedging activities, the price reaction may be unjustified. Existing contagion studies do not adequately differentiate between these two scenarios. This study will attempt to make such a distinction.

A second type of study seeks to explain the cross-sectional differences in the pricing of bank stocks. These studies use accounting data on portfolio composition to explain the differences (see Pettway 1976 and 1980; Brewer and Lee 1986; Cornell and Shapiro 1986; Shome, Smith, and Heggstad 1986; Smirlock and Kaufold 1987; James 1989; Cargill 1989; Gilbert 1990). In general, these researchers find bank stock prices inversely related to various proxies of portfolio risk. Their studies provide evidence that market participants identify certain bank characteristics as indicators of risk and then price the shares accordingly. For example, banks with low capital ratios, loans to less developed countries in the early 1980s, or exposure to energy loans in the Southeast during the 1980s had lower market value than banks with less exposure to these markets, after controlling for other factors. However, like contagion studies, these studies do not adequately show whether market participants can differentiate between institutions that have exposures to similar risk factors but have taken different precautions to protect themselves from these risks.

II. The Contribution of the Current Study

The primary reason the literature has not adequately addressed this issue is that the available accounting data do not lend themselves to quantifying, ex ante, the differences in lending standards or the differences in hedging strategies of individual banks. To overcome these deficiencies, this study uses an alternative methodology that does not rely on accounting data. The analysis relies on information about bank managers' trading of their firm's stock to assess the market's accuracy in pricing risk. The analysis hinges on the following assertion: If market participants have correctly identified the exposure that individual banks had to the New England real estate market, the bank's share price will correctly quantify the bank's exposure and thus leave few profitable trading opportunities for bank managers, who are likely the most informed regarding the bank's risk exposure. In contrast, if the market has underestimated the bank's exposure, better-informed manag-

ers have an opportunity to preserve their wealth by selling shares. Similarly, if the market overestimates the bank's exposure, managers have a profitable opportunity to purchase shares. By examining managers' trading activities around changes in the market's valuation of a bank, one can gain insight into the "insiders'" assessment of the market's pricing of their firms' shares.

The data show that banks that eventually failed began experiencing declines in their firm's share price by mid 1988, a full two years before the first bank in this sample of New England banks failed. Most of the banks that survived did not experience price declines until early 1989. The differences in the timing of these price declines suggest that the market distinguished

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early on in the crisis between those banks with a high probability of failure and those with a lower probability of failure. However, all banking institutions operating in New England with some exposure to the region's real estate market experienced substantial declines in their share prices in 1989 and 1990. For example, surviving banks on average lost 59 percent of their value in 1990 alone. Was this decline justified? Trading activity by managers of surviving institutions suggests otherwise. In the period immediately after a bank's share price had peaked, when the market aggressively discounted bank stock prices, the managers of many of the surviving firms purchased shares. Most of these purchases occurred from mid 1988 through early 1990, a period of great uncertainty regarding the financial soundness of New England's banks. This suggests that the managers of many of the region's banks did not agree with the market's assessment of their bank's exposure to the regional real estate market. The evidence supports the assertion that informational asymmetries are present in the banking industry, and that they appear to impair the market's ability to price bank stocks accurately. In order to improve the market's ability to discipline

banking institutions, an additional role for bank regulators could be to force bank management to disclose more of their private information.

III. Asymmetric Information, the Pricing of Bank Stocks, and Trading by Bank Management

Information asymmetries form the centerpiece of much of the banking literature. Theories on why banks exist center on informational asymmetries between borrowers and lenders. And in this environment, financial intermediaries exist because of the market's inability to efficiently resolve informational problems (Diamond 1984; Ramakrishnan and Thakor 1984). Asymmetries also play a central role in the literature on bank runs. If depositors, who are uninformed about the financial soundness of their bank, observe a large number of withdrawals, they infer that their bank has poor prospects and this precipitates a bank run (Bryant 1980; Gorton 1985; Chari and Jagannathan 1988). These studies emphasize the role of information processing in the banking industry.

The significance of informational asymmetries often has been assumed rather than empirically tested. However, an analysis of the pricing of bank stocks can provide evidence about the presence of such asymmetries. If capital markets are efficient, market participants fully and correctly reflect all *available* information in determining security prices. However, the key word is *available*. Given the possibility of significant information asymmetries in banking, security prices of these institutions may at times deviate from their fundamental values even if the market is informationally efficient. The firm's shares are priced "correctly" given the information available to market participants. However, if market participants had access to all information, the share valuation might be quite different.

Significant informational asymmetries would impair the market's ability to discipline banks. For market discipline to effectively replace direct regulation, prices must reflect the true risk exposure of a bank in a timely manner. Relative degrees of risk assumed by individual banks must be determined and differential prices set in order to discipline management. Share prices that deviate from their fundamental value limit this discipline. This study examines the pricing of New England bank stocks during the collapse of the region's real estate market to determine if stock price

reactions to this crisis were consistent or inconsistent with changes in firms' fundamentals.

It is difficult to assess whether market participants price shares accurately. Consider the following scenario. Two banks, bank A and bank B, have portfolios that are heavily concentrated in regional commercial real estate. After a slowing of the region's economy and a collapse in the region's commercial real estate market, both banks face a 50 percent chance of failing. As the region's economy worsens, stock market participants aggressively discount the two banks' share prices. As new information regarding the region's economy becomes available, market participants accurately reassess the effect on bank A's and bank B's

Assuming managers are in the best position to know the bank's true risk exposure, an analysis of managerial trading activity around the time of a share price decline can provide information on the accuracy of the market's pricing of bank stocks.

profitability and correctly incorporate this new information into the two banks' share prices. As the cycle runs its course, however, by chance bank B survives while bank A fails. Bank A's share price is driven to zero while bank B's share price recovers. How might one assess the market's pricing of the banks' shares at the beginning of the region's downturn? If one looks at only the ex post stock price reactions, would it be correct to conclude the market "overreacted" in bank B's case? In this simple scenario, such a conclusion would be inaccurate. Looking only at ex post returns is not informative. Ex ante, market participants correctly priced both banks' share prices, since under the assumed scenario the two banks had identical exposures to the region's real estate market. However, ex post, as the outcomes of the risks were realized, one bank survived by chance while the other failed. Thus, for the researcher trying to assess the ability of market participants to accurately identify problem banks ex ante, a requirement for effective market

discipline, looking at ex post returns by themselves is not sufficient.

Analysis of managerial trading, however, can help uncover this assessment. If the share prices of these institutions reflect their true chance of failure, few profitable trading opportunities should be available for managers. Consider a revised scenario of the above example to clarify this point. Bank A and bank B still have similar exposure to the region's real estate market, but bank B was more careful in assessing the credit quality of its loan applicants than bank A. As a result, the probability of bank A failing is greater than that of bank B. With this scenario, if market participants are able to accurately differentiate between bank A and bank B, the share price reaction should not be the same for both banks. However, if market participants are ineffective at differentiating between the financial soundness of individual banks, the stock price reactions will be similar for the two banks. If this is the case, profitable trading opportunities are available for managers of bank B, who are familiar with the quality of the bank's loan portfolio. Managers who purchase shares just after the share price has fallen below its fundamental value will realize significant trading profits when the cycle has run its course, bank B survives, and its share price recovers. Thus, examining the trading activity of managers around the time their firm's share price begins to decline can reveal a better-informed assessment of the market's pricing of their shares. Assuming managers are in the best position to know the bank's true risk exposure, such an analysis can provide information on the accuracy of the market's pricing of bank stocks.

Insider Trading Laws and Their Impact on Managerial Trading

The Securities and Exchange Act of 1934 was the first legislation attempting to deter insider trading. Section 16a of the Act requires officers and directors of publicly traded firms to report their trades to the Securities and Exchange Commission (SEC) and restricts managers from short-selling shares in the firm they manage. In 1942, the SEC's Rule 10b-5 made trading on a nonpublic "material fact" illegal. The Insider Trading Sanctions Act of 1984 and the Insider Trading and Securities Fraud Enforcement Act of 1988 increased fines and jail sentences for insider trading convictions. The insider trading regulations aim to prevent insiders from trading on the basis of material, nonpublic corporate information.

Even though insider trading laws attempt to

prevent the trading on the basis of material insider information, studies show that profitable insider trading is prevalent. Jaffe (1974), Seyhun (1986), and Rozeff and Zaman (1988) show that, on average, insiders earn positive abnormal profits from their trades. Jordan (1997) shows that such trading is also prevalent in the banking industry.

While insider trading laws prohibit insiders from trading on private material information of the firm, managers' trading of their bank's stock around the time of the deterioration of the region's economy probably did not fall within the realm of illegal insider trading. If managers based their trades on the belief that the market has overreacted to news of the region's economic troubles, and not on any *firm-specific* event such as a quarterly earnings disclosure, these trades are unlikely to be construed as violating insider trading laws. This is especially true if bank managers trade shares after a major informational release by another firm. For example, if Bank of New England disclosed large loan losses in a quarter, and if a contagion effect caused all bank stock prices in the region to decline, managers of other banks probably did not violate any insider trading laws by buying shares of their own firm, in the belief the market incorrectly assessed their exposure to the factors that caused Bank of New England's troubles. It would be very difficult to assert that such trades were based on material, nonpublic firm-specific information.

IV. The Data and Sample Selection

The population of interest includes all publicly traded banks operating in New England whose shares are traded on organized exchanges or over the counter. Data for a cross section of publicly traded banks operating in December of 1988 were collected for the years 1987 through 1994. The data were obtained from three sources: the Center for Research in Security Prices (CRSP), the Securities and Exchange Commission's (SEC) *Official Summary of Security Transactions and Holdings*, and the Board of Governors of the Federal Reserve System's *Consolidated Financial Statements for Bank Holding Companies* (Y9 report).

If a bank is part of a bank holding company, stock price data are available only at the holding company level. A bank holding company (BHC) is a parent corporation that has controlling interest in one or more commercial banks and often has controlling interest in nonbank financial subsidiaries as well. It is the most common type of organizational structure in

the industry; virtually all large banks have an affiliation with a BHC. Because market data are available only at the holding company level, this analysis studies the bank holding company. Sample selection is based on the following criteria. First, the BHC must have filed a Y9 report in March 1988 (BHCs with total consolidated assets of \$150 million or more or with more than one subsidiary bank are required to file this report). Second, a BHC is included if CRSP data are available for the years 1987 and 1988. Finally, the BHC headquarters must be located in the First Federal Reserve District. For expositional convenience, this study will refer to bank holding companies as "banks," even though technically a distinct difference exists between the two.

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Bank managers' personal trading data were obtained from the National Archives reproduction of the SEC's *Official Summary of Security Transactions and Holdings*. In compliance with the Securities and Exchange Act of 1934, officers, directors, and owners of more than 10 percent of the common stock of a firm must disclose any personal security transaction associated with their firm. These insiders must file "Form 4—Statement of Changes in Beneficial Ownership of Securities" with the SEC on or before the tenth day after the end of each month in which any change in beneficial ownership has occurred. Of the information reported, this study uses data on the type of transaction, the number of shares involved in the transaction, and the date the transaction takes place. Bank managers are defined as officers and directors of the firm and all their personal trading of their firm's common shares is included, shares directly owned as well as those indirectly owned. According to the SEC instructions for Form 4, "a person is regarded as the indirect beneficial owner of securities held in the name of another person if by reason of any contract, understanding, relationship, including a family relationship, or arrangement, such person obtains therefrom benefits substantially equivalent to those of ownership."

Any transaction likely not to have been made at the manager's discretion is excluded. Therefore, the study concentrates on managers' open market purchases and sales and excludes shares acquired via a compensation plan, shares acquired by gift, and shares acquired via reinvestment of dividends. Also, since many compensation committees require officers and directors to build their ownership stake in the firm to a certain level within one or two years of joining the firm, transactions by newly hired managers are not included. In an attempt to exclude these initial purchases, the sample includes only managers required to disclose their trades to the SEC prior to January 1, 1987. Managers whose required reporting starts after January 1, 1987 are likely to be "new" managers. This date was chosen so that the sample of managers includes only those who had been with the bank for at least two years when most of the significant stock price declines occurred (1989 and 1990). This criterion is not perfect, since it excludes some managers from the sample who have worked at a bank for a number of years but only recently obtained shares in their firm. Trades by these managers are likely to be informative but would not be included in the sample. This criterion also does not eliminate all newly hired managers. A manager hired just prior to January 1, 1987 would be included in the sample and might still be acquiring shares to fulfill stock ownership requirements set by the firm's board of directors. In order to test the sensitivity of the results to the cutoff day, the date was varied. In general, the results are not sensitive to this cutoff date.

The final criterion for sample selection is based on the acquisition status of a bank. A bank is included only if it was not acquired by another institution in the sample period. Because the purpose of this study is to evaluate the market's pricing of bank stocks by examining managerial trading, including banks that were acquired could yield misleading results. Managers at these institutions may have wanted to trade shares because they believed their shares were mispriced but decided not to trade because of potential SEC scrutiny of such trades. Seyhun (1992) shows that the additional statutory sanctions against insider trading in the 1980s deterred a particular type of insider trading, trading prior to merger and acquisition announcements. In the majority of earlier cases involving insider trading, insiders traded immediately prior to this type of disclosure. By the late 1980s, insiders were less likely to trade on this type of information than they had been in earlier years. Seyhun concludes that case law has, in effect, defined illegal insider trading as

Table 1
Sample Characteristics: Means (Medians)
for 35 Publicly Traded New England
BHCs, as of March 31, 1988

	All Firms (35)	Failed (15)	Survived (20)
<u>Book Valuation:</u>			
Total Assets (\$000)	4,168,831 (650,031)	2,898,900 (897,380)	5,121,280 (637,224)
Total Equity Capital (\$000)	267,363 (71,953)	186,290 (83,182)	328,168 (59,389)
Total Equity Capital as a Percent of Total Assets	10.2 (8.4)	10.2 (8.4)	10.2 (9.1)
Real Estate Loans (\$000)	1,355,764 (396,582)	1,176,391 (518,185)	1,490,294 (302,093)
Real Estate Loans as a Percent of Total Assets	47.8 (47.0)	56.1 (56.9)	41.5 (40.2)
Nonperforming Loans as a Percent of Total Assets	1.3 (.7)	1.9 (.8)	.9 (.6)
<u>Market Valuation:</u>			
Market Value of Equity (\$000)	298,749 (80,899)	214,490 (89,793)	361,945 (71,688)
Ratio of Market Value of Equity to Book Value	1.102 (1.049)	1.073 (.837)	1.124 (1.108)

trading before a major corporate announcement such as a merger or acquisition. Nine banks were excluded from this sample because they were acquired by another institution sometime in the sample period. Examination of managerial trading at these institutions agrees with Seyhun's (1992) results in that such trading is far less prevalent in these institutions than in the remaining banks in the sample.

The final sample selection yielded 35 bank holding companies that were publicly traded as of January 1987.¹ Of these 35 institutions, 15 had failed as of the end of 1994 while 20 were still in operation. Table 1

¹ One bank holding company, State Street Corporation, met all data requirements but was excluded from the sample. State Street's primary business is custodial services and thus it had minimal exposure to New England's real estate market. Since the study is assessing the market's ability to accurately determine a bank's exposure to the region's real estate market, State Street is excluded.

presents the characteristics of these institutions as of March 31, 1988.

V. The Stock Market's Valuation of New England Bank Stocks, 1988 to 1994

How did the stock market price New England bank stocks in response to the region's economic downturn and subsequent recovery? What was the timing of these price reactions? Were the reactions more severe for banks most exposed to the region's troubles? All banks in the sample experienced significant price declines between 1988 and 1990. In general, the declines were more severe and occurred earlier for those banks that had the greatest exposure to the region's economic downturn. The share prices of banks that were able to survive the region's business cycle made strong recoveries starting in 1991.

Table 2 presents the average returns for the years 1988 to 1994 for the 35 banks in the sample. Following the stock market crash in October of 1987, New England banks' share prices rose in late 1987 and early 1988. All banks in the sample experienced increases in their share price coming into 1988. However, these rising share prices peaked for each banking firm sometime between January of 1988 and September of 1989 and by mid 1990, share prices of all New England banks had fallen dramatically. On average, bank shares lost 77 percent of their value (the median return was -76 percent) from the start of 1988 through the end of 1990. Not a single firm had a positive return over the time period. Returns ranged from -100 percent for institutions that failed to a maximum of -7 percent. Ninety percent of the firms lost at least 55 percent of their market value. In contrast, during the same period, the return on a broad-based stock market portfolio was +34 percent (the portfolio examined is a value-weighted portfolio of all New York Stock Exchange and American Stock Exchange Stocks).²

Most banks' share prices reached their lows for

² Researchers often focus on "excess returns" rather than the raw returns that are used in this study. An excess return is the return on a firm's shares relative to some benchmark return. One example of an excess return is a comparison of the return on bank i's shares to the return on the S&P 500 index. Such a comparison allows one to filter out systematic factors that affect all equity prices from firm-specific factors that may only affect individual equity prices. A number of different methodologies were used in this study to calculate excess returns. The results were qualitatively similar, whether excess returns or raw returns were examined. Raw returns are presented here because the interpretation of these returns is much more straightforward than work with excess returns.

Table 2
Return Characteristics of Sampled New England Bank Holding Companies

Year	Portfolio of 35 New England BHCs ^a		Market Portfolio ^b	
	Value of portfolio at end of year t (Jan. 1, 1988=100)	Return on portfolio in year t (%)	Value of portfolio at end of year t (Jan. 1, 1988=100)	Return on portfolio in year t (%)
1988	101.26	1.26	113.86	13.86
1989	66.64	-34.57	146.38	29.55
1990	23.84	-64.92	137.56	-7.36
1991	28.56	19.26	183.93	34.90
1992	56.83	94.13	200.50	9.07
1993	70.50	24.24	223.53	11.78
1994	80.86	15.23	222.43	-1.12

^aEqually weighted portfolio of 35 BHCs' shares. Fifteen BHCs failed during the sample period. These banks are included in the sample through 1994. However, their return after failure is coded as 0.0 percent.

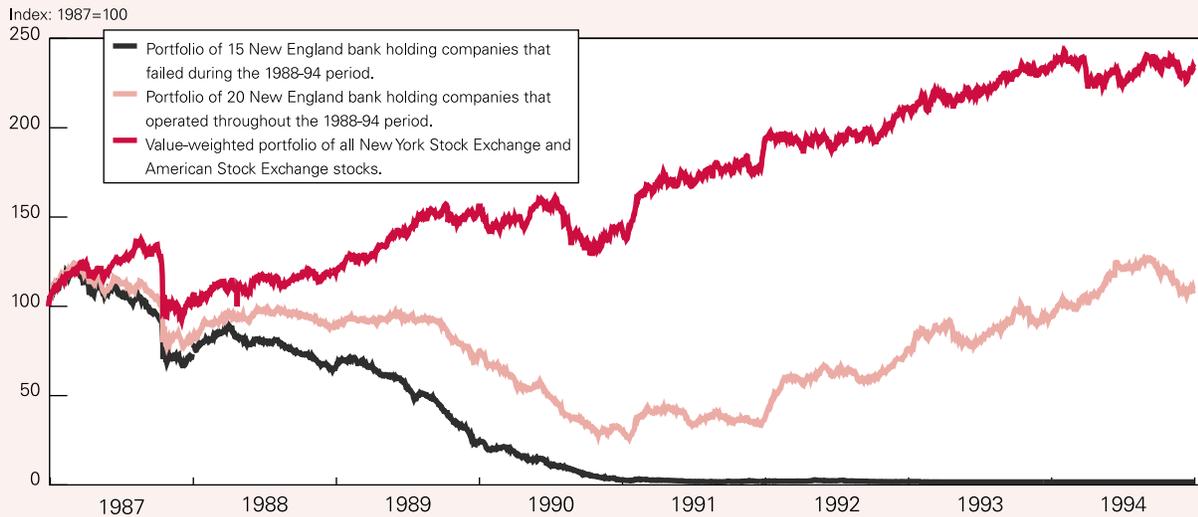
^bValue-weighted portfolio of all New York Stock Exchange and American Stock Exchange stocks.

the sample period by the end of 1990. Of the 20 surviving banks in the sample, most experienced strong stock price returns in the following years. Shares of the surviving firms, on average, appreciated by 250 percent between 1991 and 1994. In contrast, the market portfolio during this time period appreciated just 63 percent. The lows for the 15 banks that failed correspond to their failure dates and thus occurred sometime after 1990. However, by the end of 1990, these firms' serious financial troubles were well-known by the market, as evidenced by their shares having lost more than 96 percent of their value. Figure 1 displays these results.

The decline in stock prices did not begin in early 1988 for all banks. Table 3 presents a more detailed examination of the timing of price declines. The results in Table 3 indicate that 66 percent of the banks had declining share prices by January 1, 1989. This percentage had increased to 83 percent by July. All banks had reached their peak share price by September 1989. Table 3 also contrasts the market's pricing of banks known ex post to have been more exposed and less exposed to the region's economic downturn. By taking advantage of hindsight, the pricing of banks that failed during the sample period can be compared to the pricing of banks that operated throughout the sample period. This sample split can help identify

Figure 1

Value of Three Portfolios, 1987 to 1994



whether market participants treated these institutions differently.³

The results in the upper panel of Table 3 indicate that 87 percent of the failed firms (13 of 15) had reached their peak share price by May 1, 1988. By July 1, 1988, the percentage increases to 93 percent. In comparison, the lower panel of this table shows that only 15 percent of the surviving firms (3 of 20) had reached their peak by May 1, 1988, and 35 percent by July 1. It was not until early 1989 that the majority of surviving firms experienced share price declines. The magnitudes of the price declines also varied considerably. Comparing the returns on a portfolio consisting of an equal weighting of the 15 failed institutions with that of a portfolio consisting of an equal weighting of the 20 institutions that survived reveals this variation (third column, Table 3). From March 1, 1988 through March 1, 1989, the portfolio of failed institutions declined almost 20 percent. During the same period, the portfolio of surviving firms had a modest gain of 0.42 percent. This suggests that the market assessed differences between these two types of institutions beginning in early 1988. By mid 1989, however, all

institutions began to experience steep declines in their share prices. From July 1, 1989 through July 1, 1990 the portfolio consisting of failed firms lost 86 percent of its value, the portfolio of surviving firms lost 46 percent. Within the portfolio of surviving firms, the lowest return was -69 percent, the highest was -21 percent.

The portfolio composition of a bank, as well as its financial performance during 1988 and 1989, can help explain such differences in stock price movements. Table 4 compares the characteristics of banks whose shares experienced the greatest declines with those of banks with more moderate changes. In 1988, banks with share price returns in the lowest quartile had a higher concentration of real estate loans, a higher percentage of loans classified as nonperforming, a higher percentage of loans charged off during the year, and lower profits than banks in the higher quartiles. Market participants started discounting some banks' shares aggressively in 1988. These negative reactions correspond to those institutions that had the poorest performance during the year along with high exposure to the region's real estate market.

These patterns continued in 1989. Banks falling into the lowest quartile of stock price returns had the lowest accounting profits and the highest concentration of real estate loans. The lower panel of Table 4 presents the results. In contrast to 1988, however, very few banks in any quartile escaped the year without a

³ This is not to suggest that the market *should have* priced these institutions differently, but rather, to ask whether it *did* price these institutions differently. The discussion in section III was meant to clarify why a bank that survives could experience an initial stock price reaction similar to that of bank that fails.

Table 3

Timing of Share Price Declines, New England Bank Holding Companies, 1988 to 1991

		Failed Bank Holding Companies (N = 15)		
		Number of BHCs whose share price had peaked	Percent of BHCs whose share price had peaked	Percent change in value of a portfolio of failed BHCs from March 1, 1988
<i>As of:</i>				
1988:	March 1	4	28	.00
	May 1	13	87	-2.17
	July 1	14	93	-5.00
	September 1	14	93	-9.60
	November 1	14	93	-14.34
1989:	January 1	14	93	-21.66
	March 1	14	93	-19.21
	May 1	14	93	-26.90
	July 1	14	93	-36.05
	September 1	15	100	-42.69
	November 1	15	100	-58.32
1990:	January 1	15	100	-70.91
	July 1	15	100	-86.11
1991:	January 1	15	100	-96.55
	July 1	15	100	-97.73
		Surviving Bank Holding Companies (N = 20)		
		Number of BHCs whose share price had peaked	Percent of BHCs whose share price had peaked	Percent change in value of a portfolio of surviving BHCs from March 1, 1988
<i>As of:</i>				
1988:	March 1	2	10	.00
	May 1	3	15	+3.21
	July 1	7	35	+6.80
	September 1	7	35	+3.98
	November 1	9	45	+1.38
1989:	January 1	9	45	-2.47
	March 1	9	45	+4.42
	May 1	9	45	+1.34
	July 1	15	75	+1.10
	September 1	20	100	+0.09
	November 1	20	100	-12.49
1990:	January 1	20	100	-18.97
	July 1	20	100	-45.96
1991:	January 1	20	100	-66.76
	July 1	20	100	-63.45

drop in share price. Banks in the highest quartile of returns for the year, on average, had a -2.32 percent return. The fact that these banks still reported significant levels of capital (8.5 percent) and were still profitable (0.5 percent return on assets) shows the

extent of the market's concern about all banks' exposure to the region's declining economy.

The above analysis seeks to chronicle the market's valuation of New England banks between 1988 and 1994. No attempt has been made to assess how accurate market participants were in their pricing of shares. Rather, the timing and severity of price changes are documented, and the characteristics of banks with the largest share price declines are compared to those with more modest changes. The analysis supports the following conclusions: First, all banks in the sample experienced large declines in their share price. Fifteen banks failed, resulting in a share price return of -100 percent. Of the remaining 20 banks, 90 percent lost at least 50 percent of their value between 1988 and 1991. Second, the timing of the price decline varied considerably. About 60 percent of the banks began experiencing price declines by mid 1988; however, this number did not increase significantly until mid 1989. By September of 1989, the share prices of all banks were declining. Third, whether a bank eventually failed or survived helps explain the differences in this timing. Virtually all banks that went on to fail experienced price declines by mid 1988. The majority of institutions that survived did not experience price declines until mid 1989. Finally, banks with the largest drops in share prices also had the highest concentrations of real estate loans and were the worst performers in 1988.

Together, these patterns suggest that market participants correctly assessed the relative exposures of New England banks to the region's deteriorating economy. The striking finding is that the banks that later failed had share price declines well before banks that went on to survive. Some of this market

reaction is of course attributable to the earlier and faster deterioration of the failing banks' profitability, and not to changes in the market's assessment of a bank's ex ante exposure to the impending collapse of the New England real estate market. However, the fact

Table 4

Selected Characteristics of New England Bank Holding Companies, Ranked by Severity of Stock Price Decline, 1988 and 1989

Year End 1988, Means	BHCs whose return in 1988 was in the			
	lowest quartile	second quartile	third quartile	top quartile
Total Assets (\$000)	882,762	5,062,911	4,672,912	7,343,027
Real Estate Loans as a Percent of Total Assets	54.29	48.39	50.93	40.76
Total Equity as a Percent of Total Assets	9.63	8.52	8.89	10.14
Nonperforming Loans as a Percent of Total Assets	5.16	1.85	2.23	1.85
Loan Charge-off as a Percent of Total Assets	.80	.48	.27	.25
Net Income as a Percent of Total Assets	.07	.66	.80	.70
Return on Common Shares in 1988 (Percent)	-22.40	-4.20	+10.70	+28.89

Year End 1989, Means	BHCs whose return in 1989 was in the			
	lowest quartile	second quartile	third quartile	top quartile
Total Assets (\$000)	1,186,533	4,276,905	5,858,673	8,077,671
Real Estate Loans as a Percent of Total Assets	59.00	52.00	48.00	42.00
Total Equity as a Percent of Total Assets	4.00	7.00	8.20	8.50
Nonperforming Loans as a Percent of Total Assets	11.70	7.00	4.00	2.00
Loan Charge-off as a Percent of Total Assets	3.99	1.30	.60	.28
Net Income as a Percent of Total Assets	-5.50	-2.00	.22	.52
Return on Common Shares in 1989 (Percent)	-71.61	-53.05	-23.93	-2.32

that firms that failed in late 1990 and 1991 experienced sharp declines in their share prices in mid and late 1988 is striking. In general, firms that survived did not experience such declines until late 1989.

The above analysis still does not fully assess the ability of market participants to price bank stocks accurately. In general, it appears the market got the direction of the pricing right, since the profitability of all banks deteriorated during the downside of the region's business cycle. However, it is uncertain whether the magnitudes of the market's price reactions were accurate. The difficulty in evaluating the market's ability to price bank stocks looking solely at ex post stock returns has already been described. This study's results so far suggest that market participants discounted bank stocks with the highest risk exposures as measured by accounting data (banks with the highest concentration of real estate loans experienced the largest share price declines), and they also discounted bank stocks with the worst contemporaneous performance (those banks with the lowest profits, highest nonperforming loans, and most loan charge-offs experienced the largest share price declines). However, for market discipline to be effective, the pricing of banks stocks must incorporate not only the difference in risk exposure as measured by accounting

data and the firm's contemporaneous performance, but also the true ex ante riskiness of the bank's portfolio. Relying on accounting data alone to proxy for the riskiness of a bank may miss differences among banks in lending standards as well as hedging strategies. If the market responds to accounting data and is still ineffective in determining the true exposure of the bank, profitable trading opportunities will present themselves for bank managers. Thus, managerial purchases around the time the market assesses the bank's prospects as weak would suggest that managers believe the market inaccurately priced their bank's stock. The next section examines trading by bank managers in an attempt to uncover insider assessments of the market's pricing of their firm's shares.

VI. Managers' Responses to the Stock Market's Pricing of Their Bank's Shares

Did insiders agree with the market's assessment of their firm's exposure to the region's deteriorating economy? The pricing of a bank's stock in the period 1988 through early 1990, and the response of insiders to changes in their firm's share price, can help identify insiders' assessment of the market's pricing of the

ex ante riskiness of their institution. Some banks experienced a drop in profitability in 1988 and 1989. However, most banks did not incur large losses until 1990 and 1991. Therefore, specifying the period of 1988 and 1989 and examining the pricing of New England bank stocks, along with managerial responses to this pricing, should uncover insiders' assessment of the market's ability to accurately price their banks' exposure to the region's economic downturn. Bank managers are likely to have based their trades during this period on their assessment of their bank's exposure to the region's downturn rather than on the realizations of their exposure to this downturn, since the majority of the losses had not yet been incurred. Insiders who disagreed with the market's assessment could reveal this disagreement by trading shares in their firm.

As discussed above, all banks in the sample saw their share price increasing coming into 1988. Sometime between January of 1988 and September of 1989, each firm reached its peak share price. Prices then fell throughout 1990 for all banks in the sample. This analysis concentrates on stock price movements in 1988 and 1989, a period of great uncertainty as to how the region's economic downturn would affect banks' profitability. If market participants correctly identified a bank's exposure, few managerial trades should occur. However, if insiders better anticipated the adverse effects of the economic downturn on their

As the length of time after the peak share price of a bank increases, a pattern emerges. Surviving firms had widespread open market purchases by managers, whereas those in the group that later failed had just a few.

firm's profitability, before banks experienced their large losses in 1989 and 1990, managerial selling should occur. If the market overestimated a bank's exposure to the regional downturn and pushed a firm's share price below its fundamental value, managerial purchases are likely.

This study examines trading activity by bank

Table 5
Bank Stock Trading by Managers of 35 New England Banks, Key Days around Peak Share Price, 1988 and 1989

Number of days from peak share price	Of the 15 banks that went on to fail:		Of the 20 banks that survived:	
	Net Purchasers	Net Sellers	Net Purchasers	Net Sellers
180 days before to day of peak	4	3	6	3
Days following peak:				
1 to 30	2	1	3	2
31 to 210	3	3	9	2
31 to 390	3	5	12	1
211 to 390	2	6	10	1

management before and after the bank's peak share price. The peak share price is defined as the highest closing price that occurred between 1988 and 1990. Insiders are defined as officers and directors of a bank. A bank is considered a net purchaser if the dollar value of its managerial open market purchases exceeds the dollar value of managerial open market sales during a specified period. A bank is considered a net seller if the dollar value of managerial open market sales exceeds that of the dollar value of managerial open market purchases. The sample is split by failure status of the bank. Table 5 presents the results.

Since all banks in the sample had rising share prices going into 1988, it is likely that in early 1988 market participants either did not anticipate the region's severe recession at all or put a low probability weight on such an event. Did managerial insiders systematically foresee a declining economy and sell bank shares before share prices declined? Table 5 provides evidence that insiders were net purchasers rather than net sellers. In the six months prior to a bank's share price peak, no widespread selling by insiders occurred. In fact, 29 percent of the banks (10 of 35) were net purchasers of shares during this period while net sellers only accounted for 17 percent (6 of 35). This absence of widespread managerial selling in the period prior to the share price declines suggests that insiders did not view the pricing of their firm's shares as too high.

Sometime between January of 1988 and September of 1989, new information changed the market's evaluation of the prospects of the region's banks. Market participants interpreted new information in

ways that made them collectively believe that the previous share price overvalued the firm. As time went on, market participants continually updated their probability assessments and expectations as new information was disclosed about the region's banks and the declining economy. Sometime between 1988 and 1989, share prices began to decline for all banks. Examining managerial trades during these price declines can be used to uncover insiders' assessment of the magnitude of the price declines.

Managerial trading during the 30 days just after a bank's share price peaked provides little evidence that insiders disagreed with the initial reaction. Fourteen percent of the firms were net purchasers, 9 percent net sellers. However, as the length of time after the peak share price increases, a pattern emerges. Surviving firms had widespread open market purchases, whereas those in the group that failed had just a few. During the six months beginning 30 days after a firm's share price had peaked, nine of the 20 surviving firms had insiders purchasing shares, while only two firms were net sellers.⁴ In contrast, for the sample of institutions that failed, three banks were net purchasers and three were net sellers. This pattern continues when looking at the managerial trading activity during the year beginning 30 days after the firm's peak share price. Sixty percent of the firms that survived were net purchasers of their firm's shares while only one of the surviving institutions had net sales. During the same period, the patterns for banks that failed were very different, with more net sellers than purchasers.

The results shown in Table 5 are consistent with the conjecture that insiders respond to the repricing of their shares by trading. However, the purchases by managers at surviving firms, and the lack of sales, could also be consistent with the periodic accumulation of shares to increase their ownership in their firm. If increasing levels of ownership motivated these trades, one would expect to see purchases, and few sales, throughout the sample period. Table 6 presents evidence contrary to an accumulation explanation for insider purchases. Between 1992 and 1993, after the share prices of many of the surviving firms had returned to their pre-1989 levels, widespread open market sales were prevalent. Ten of the 20 surviving

⁴ The first 30 days after a bank's share price peaks are excluded because many did not experience significant percentage declines in their share price immediately after the peak price. Rather, it was not until weeks after the peak share price that the cumulative daily price changes compounded into a significant price decline.

Table 6
Trading by Managers of Surviving Banks

31 to 390 days after the peak share price (1988–1989):		
	Number of Banks That Were Net Purchasers	Dollar Value of Managerial Purchases
	12	\$1,459,165
Insider Sales by Surviving Banks (1992–1993):		
	Number of Banks That Were Net Sellers	Dollar Value of Managerial Sales
1992	10	\$5,190,732
1993	8	\$6,244,356

firms disposed of over \$5 million worth of shares of shares in 1992 and eight of the 20 firms had over \$6 million in sales in 1993. This evidence suggests that the accumulation of shares explanation probably did not drive these results.

It is important to note that the majority of open market purchases by insiders of surviving firms occurred in 1988, 1989, and early 1990, when bank share prices were falling in reaction to news of lower bank profitability, increasing loan defaults, and a rapidly deteriorating regional economy. Great uncertainty existed regarding the future of any bank that had exposure to the region's real estate market. The fact that 15 of the 35 banks in the sample failed shows the extent of the problems. But were all New England banks on the brink of failure? Did those that survived do so by chance? A look at managerial trading suggests otherwise. Over one-half of the surviving banks had insiders purchasing shares *during* this period of uncertainty, suggesting that these managers believed their bank would survive the economic downturn and that the current share price did not reflect the firm's true value. The strong comeback in share prices in 1992 and 1993 suggests that these insiders were correct.

Only three of the banks that failed had open market purchases by managers after their share price had peaked. Two of the banks, Citytrust and New Hampshire Savings Bank, had managers who made sizable open market purchases consistently throughout the sample period, nearly every month. This pattern of trading was not found at any other bank. It was not until their banks' share prices had fallen 95

percent from their peak price that some insider selling occurred. This type of trading is consistent with an alternative motivation for managerial trading, corporate control. Since managers did appear to “time” their trades in these cases, the trades may reflect managerial attempts to alter the control of the bank. Search for further evidence of corporate control fights in these two cases were unsuccessful, and thus the exact rationale for these purchases is still uncertain. However, the pattern of consistent purchases throughout the sample period, regardless of whether the share price was rising or falling, high or low, suggests the trades were made for reasons other than an attempt to exploit a perceived mispricing of their shares.

The third bank, Bank of New England Corporation, had some insider sales in 1988 but also some sizable managerial purchases in 1989, when the share price had already fallen to 50 percent of its high. This case shows no evidence of any corporate control issue that could help explain the purchases. The purchases are consistent with insiders being unaware of the depth of the bank’s problems or overconfident of their ability to recover from such problems (Peek and Rosengren 1997). Either way, managerial trading in this case clearly gave a false signal. Nevertheless, false signals occurred in only three of the 35 banks in the sample and two of these may be explainable. In contrast, insiders in 17 of the 35 banks (12 surviving banks were net purchasers of shares, 5 failing firms were net sellers of shares) made trades that correctly signaled the future course of their bank.

VII. Conclusions

Evidence presented in this article indicates that a significant number of bank managers, those expected to be the most knowledgeable about the fundamentals concerning their firms, did not agree with the market’s assessment of their firm’s exposure to New

England’s declining economy in the early 1990s. A number of banks that survived the region’s downturn had insiders purchasing shares in their own firm as the share price declined. These trades were made primarily in 1988 and 1989, a time when bank managers were likely to base their trades on their assessment of their bank’s exposure to the region’s downturn rather than on the realizations of their exposure to this downturn.

This distinction is important because of implications regarding market discipline. If market discipline is to be effective, the market must be able to identify relative degrees of risk assumed by individual banks. In this case, many banks had insiders who did not agree with the market pricing of their shares. Given hindsight, the fact that the banks whose managers were buying shares were also the banks that survived suggests that the market did not accurately assess all banks’ exposure to New England’s economic downturn. In this case, with a great deal of financial uncertainty, it appears that market participants were unable to detect the true risk exposure of individual banks, so all bank stocks were discounted heavily. This evidence is consistent with the literature explaining panic-driven bank runs.

Evidence also indicates that more than “luck” determined which banks failed and which banks survived the region’s downturn. Since managerial trading occurred early in the business cycle, and since this trading in general turned out to be a helpful predictor of which banks survived, managers of these institutions must have been confident they had taken precautions to make it through tough times. Unfortunately, this information was not effectively conveyed to the market in a timely manner. This failure suggests an additional role for regulators, that of forcing bank managers to disclose more of their private information. Greater disclosure by bank insiders could make market forces a more effective means of disciplining banks.

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